VIRGINIA STANDARDS OF LEARNING

Spring 2004 Released Test

END OF COURSE
Biology

Large Print Form

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DIRECTIONS

Read each question carefully and choose the best answer.

SAMPLE

Which of these can be used to measure atmospheric pressure?

A An anemometer
B A barometer
C A thermometer
D A seismometer

GO ON

1 Field biologists often attach radio transmitters to highly mobile animals, which allows them to track the animal's movement. This information most often shows the animal's

A home range size

B ability to protect itself

C daily food consumption rate

D body temperature regulation

2 Scientists studied a flock of tundra swans that spent the winter along rivers in Virginia. The swans migrate in the spring to other locations. What would be the BEST way for scientists to distinguish between the birds they study in Virginia and flocks in the summer location?

F Capture and put coded bands on the birds in Virginia, then record the bands seen on birds in the summer location

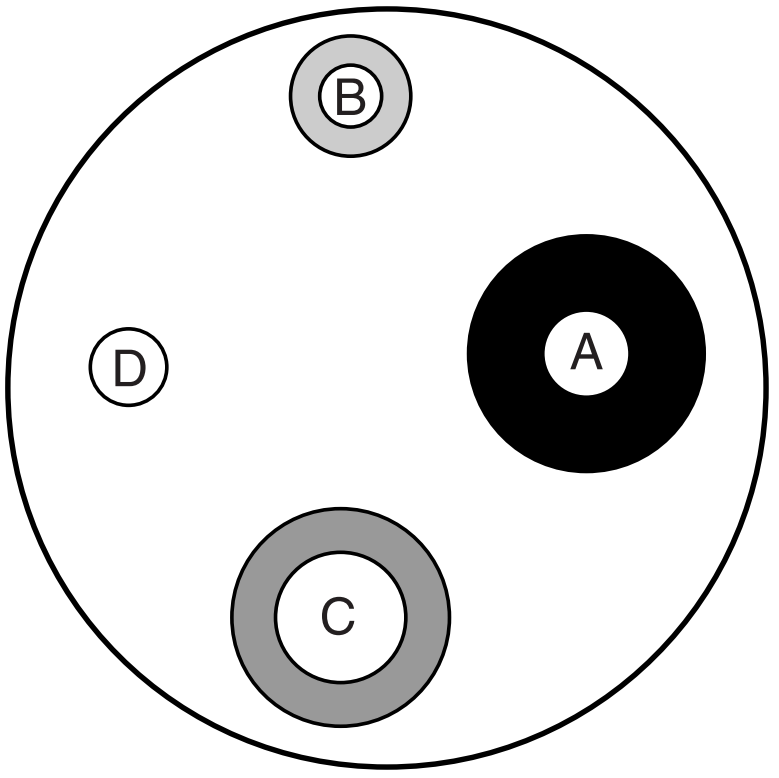
G Take detailed photographs of winter flocks in Virginia and summer flocks in other locations and compare photographs

H Follow the Virginia flock by vehicle on a daily basis

J Capture birds in the expected summer location and dissect them to find clues that show the birds were in Virginia during the winter

GO ON

3



Sarah designed an experiment to find out which mouthwash was most effective against some bacteria. She cut out four different circles from a paper towel and soaked each circle in a different mouthwash. She put the circles on a nutrient agar-coated Petri dish that was covered with bacteria commonly found in the mouth. She then incubated the plate for 24 hours. The picture shows the results of this test. Which of the following should Sarah do to improve her experiment?

GO ON

A Use a smaller Petri dish

B Use different kinds of bacteria

C Use the same size paper circles for all mouthwashes

D Use the same type of mouthwash on each paper circle

4 **Hypothesis: More pine seeds germinate after a forest fire.**

The most valid and reliable test of this hypothesis would include an experimental group of pine seeds that was recovered from a fire area and pine seeds that were

F germinated after a fire

G tolerant of fire

H found before a fire

J placed in a fire

5 A student wanted to look at plant growth in five different soil samples. He planted the same type of seeds in identical containers and left them together in full sunlight. He gave each plant the same amount of water and charted the growth of each plant stem. What is the independent variable in this experiment?

A Soil

B Light

C Container

D Seeds

6 **In 1893, a one-million-acre area of the Grand Canyon National Forest Reserve was home to an estimated 3,000 Rocky Mountain mule deer. Cattle, sheep, and horses also roamed the reserve. In 1906, government hunters killed off hundreds of mountain lions, coyotes, and bobcats when the area was set aside as the Grand Canyon National Game Preserve. The number of Rocky Mountain mule deer rose to over 100,000 by 1923. What was the approximate density of the mule deer in 1923?**

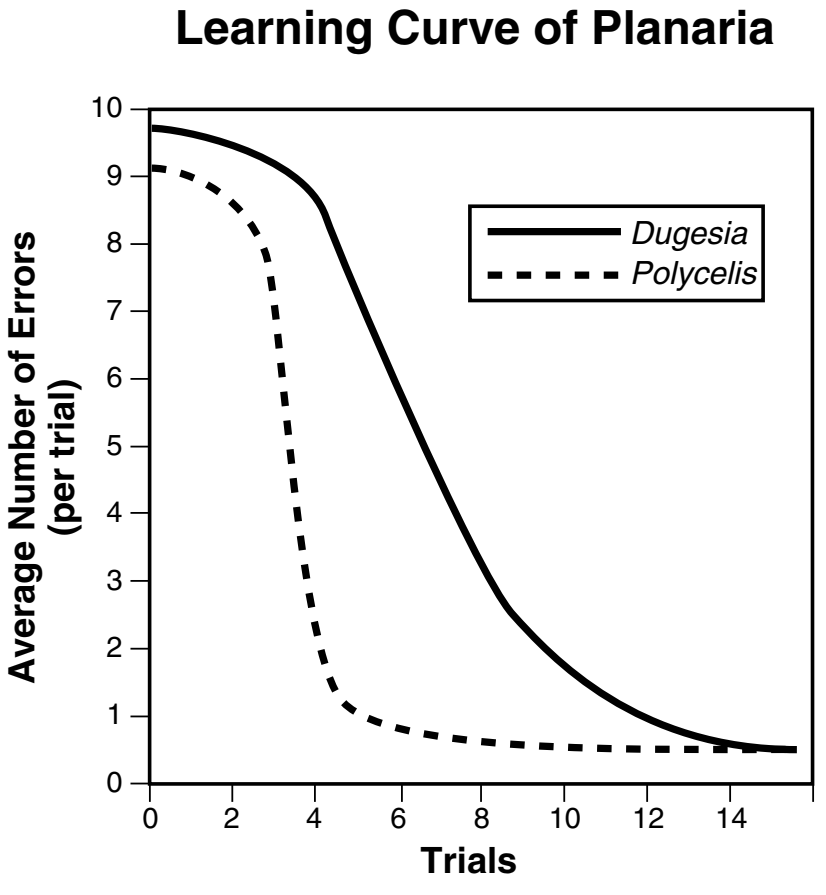
F 1 for every acre

G 1 for every 10 acres

H 1 for every 100 acres

J 1 for every 1,000 acres

7



These data were collected during an experiment in which two species of planaria were trained to make left turns in a T-maze. Which conclusion is best supported by these data?

A ***Polycelis*** **learns faster than** ***Dugesia.***

B ***Dugesia*** **learned more information than** ***Polycelis.***

C ***Polycelis*** **made more mistakes than** ***Dugesia.***

D ***Dugesia*** **reacted faster than** ***Polycelis.***

GO ON

8 Scientists have noted a decline in fungi species dating back to the early 1900s. Annual crops of edible mushrooms in France and Germany have declined since 1950. One hypothesis to explain this decline is that edible fungi are being overharvested. Global warming and air pollution have also been considered as contributing to the decline. Which of the following would exclude overharvesting as the cause of the decline?

F Fungal-population increases in tropical regions

G Similar declines among edible North American species

H High fungal numbers in nitrogen-poor soils

J A parallel decline in non-edible species

9 Henry's project is on porcupine populations in Virginia. He would like to use the phone book to help him make contacts. His most reliable contacts would probably be found by looking in the phone book under

A travel agencies
B newspapers
C state agencies
D civil engineers

10 A certain virus causes a disease of the digestive system. What is the *most* likely source of this virus?

F Air
G Soil
H Water
J Insects

11 Which of the following molecules is most abundant in the cells of the human body?

A Amino acids
B Nucleotides
C Lipids
D Water

12 Pepsin is found in the human stomach and breaks down proteins to smaller peptides. What is pepsin?

F A mineral
G An enzyme
H A carbohydrate
J A vitamin

GO ON

13 In plant cells, the organelles that conduct photosynthesis and the organelles that conduct cellular respiration are the

A chloroplasts and chromoplasts
B chromoplasts and leukoplasts
C leukoplasts and mitochondria
D chloroplasts and mitochondria

14 Which of the following organelles is present in both prokaryotes and eukaryotes?

F Nucleus
G Ribosome
H Golgi body
J Endoplasmic reticulum

GO ON

15

Experimental Observations

1. Nucleus is present.
2. Cell wall is present.
3. Chloroplasts and mitochondria are both present.

The eukaryotic organism described above should be classified as

A an animal

B a bacterium

C a fungus

D a plant

GO ON

16 Which of these functions most like the “brain” of a cell?

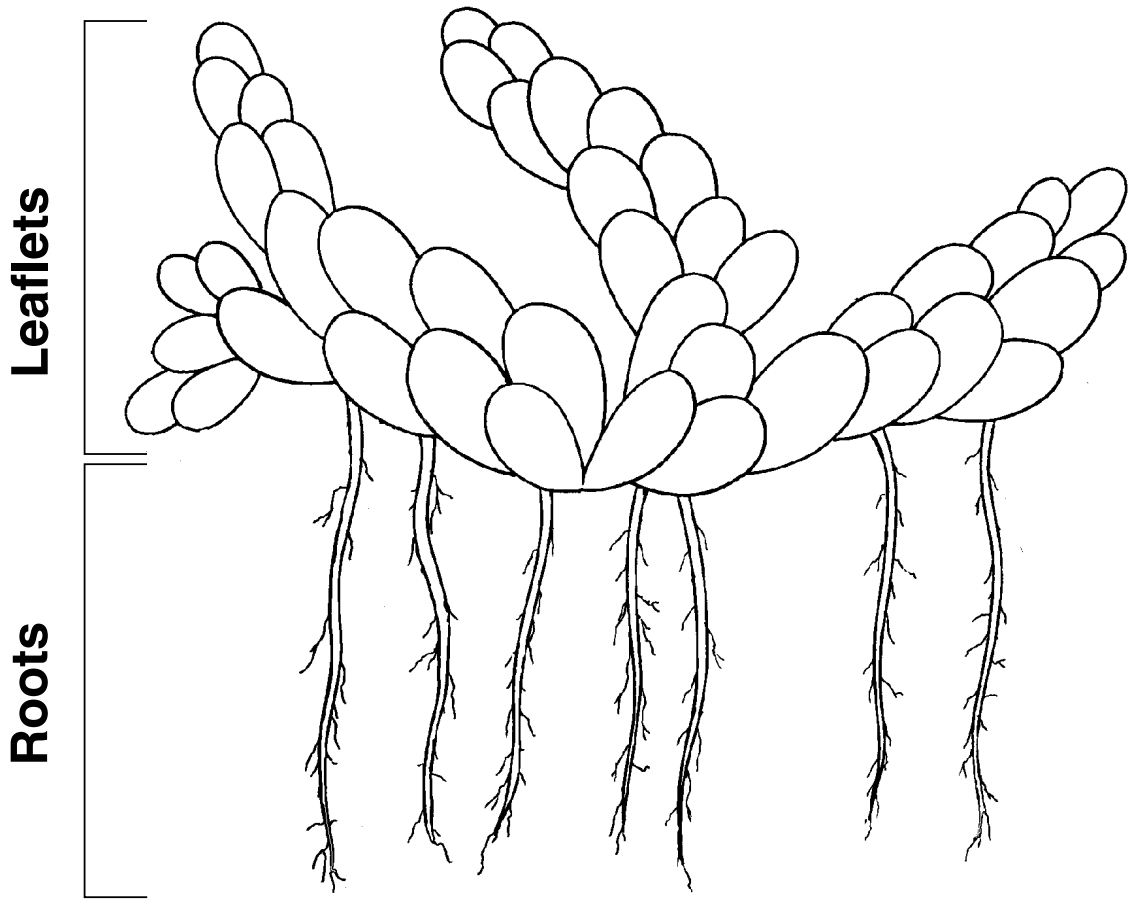
F The nucleus

G The Golgi apparatus

H The mitochondrion

J The smooth endoplasmic reticulum

17



Azolla caroliniana

The picture shows a fern that is sometimes used in an aquarium or outdoor pool to provide shade and a spawning medium for fish. To which kingdom does *Azolla caroliniana* belong?

A Monera

B Protista

C Fungi

D Plantae

GO ON

18 Which of these processes is carried out in the same way in both plants and animals?

F Cellular respiration

G Asexual reproduction

H Circulation of body fluids

J Excretion of metabolic waste

19 Which of these does NOT depend on muscle contraction?

A Eye movement

B Arm movement

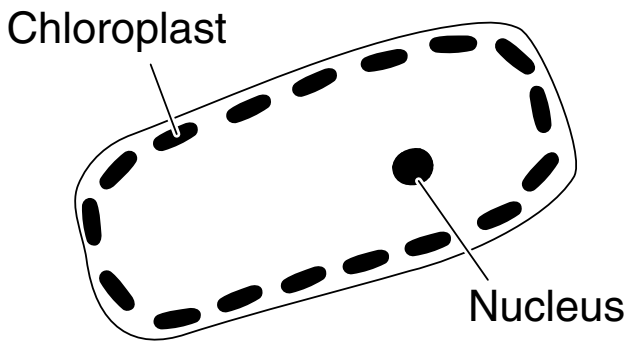
C Reflexes

D Pain perception

GO ON

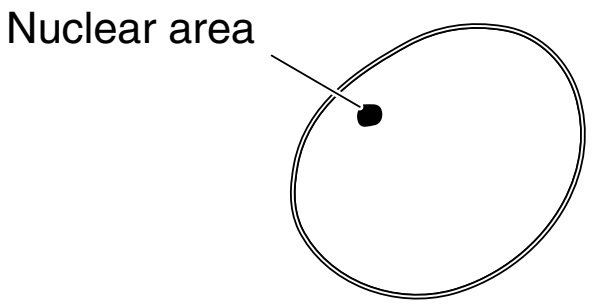
20 Which of these is capable of moving quickly in response to its environment?

F



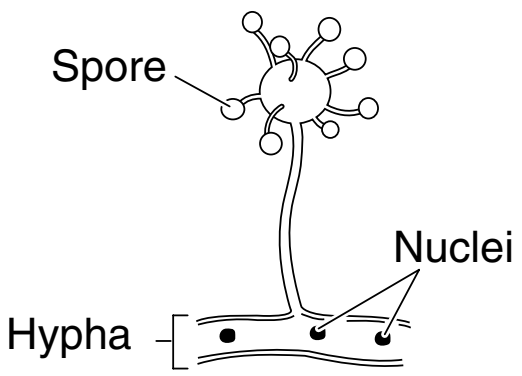
Elodea

G



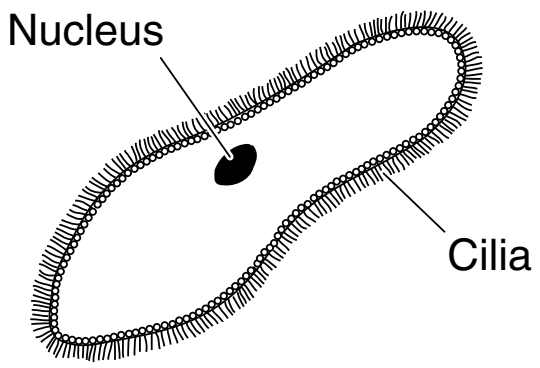
Coccus bacterium

H



Mildew

J



Paramecium

GO ON

21 Unlike other animals, mammals can perspire. The main benefit of perspiring is that it

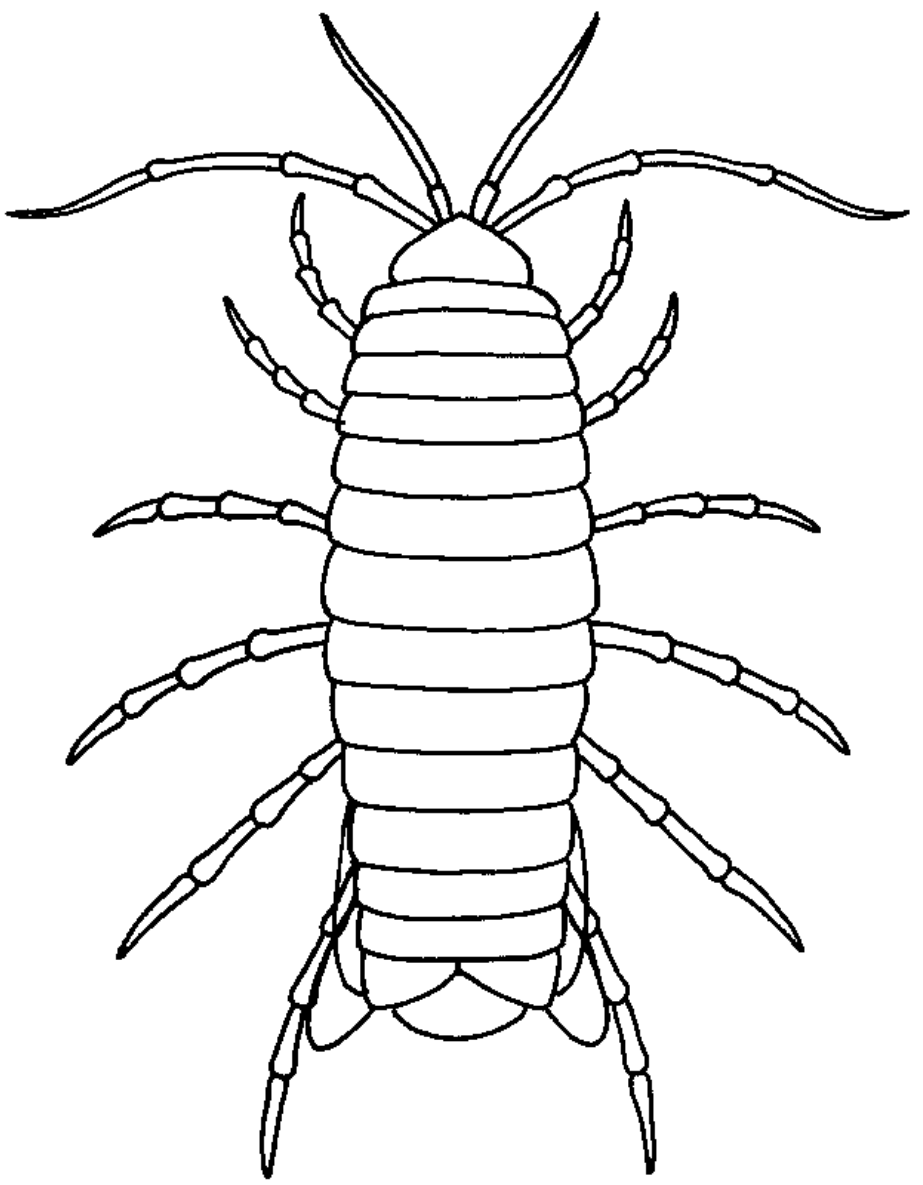
A removes extra water from the cells
B cools the skin with evaporation
C removes dirt from the surface of the skin
D relaxes the muscles

22 What is the major function of the valves found in human veins?

F Preventing movement of blood clots
G Reducing the back flow of blood
H Adding oxygen to blood plasma
J Slowing the red blood cells

GO ON

23



The picture shows an organism that lives in the lakes of two caves in Augusta County, Virginia. Its primary food source appears to be fine bits of organic matter that drift into the cave lakes. This cave-dwelling species belongs to the kingdom

A Monera

B Protista

C Fungi

D Animalia

GO ON

24 In cows, long hair is dominant to short hair. In a cow that is heterozygous for long hair, what percentage of the cells undergoing meiosis will carry the dominant allele?

F 25%

G 50%

H 75%

J 100%

GO ON

25 The reduction of the chromosome number during meiosis is most important for

A preventing the nucleus from becoming larger with each cell division
B maintaining the chromosome number during sexual reproduction
C keeping the amount of DNA in the cell at a minimum level
D allowing the growth of the cell without increasing the DNA content

26 Mitochondria function most like

F a pipeline
G a power plant
H a packaging plant
J an instruction book

GO ON

27

	T	t
T	T T	T t
t	T t	t t

In pea plants, tall plants are dominant to short plants. If two heterozygous tall plants are crossed, what percent of the offspring will probably be short?

A 75%

B 50%

C 25%

D 0%

GO ON

28 People who have been exposed to excessive radiation often experience mutations. If these mutations only occur in somatic (body) cells, these people may

F pass on these mutations to their offspring

G experience an increased risk of cancer

H develop entirely new DNA sequences in all cells

J experience difficulties replicating RNA

29 The triplet code of bases for RNA may be represented by all of the following EXCEPT

A CGT

B CGA

C CGG

D CGU

GO ON

30

Virginia Pine
Pinus virginiana

Shortleaf Pine
Pinus echinata

Eastern White Pine
Pinus strobus

Longleaf Pine
Pinus palustris

A biology student collected pine needles from four different species of trees. She then made a list of the common and scientific names of each species. Use the list to help you complete the following statement. These four different pine trees are NOT classified in the same

F order

G species

H genus

J phylum

GO ON

31 Giant fossil ferns have been found in Canada. Which conclusion can be drawn from this discovery?

A Canada once had a much warmer climate.

B Giant dragonflies once lived among the ferns.

C Canada was once covered by an ancient sea.

D Dinosaurs once lived in Canada.

32 Which of the following would most likely change the current classification of two closely related flower species to a single species?

F The discovery of a new, related species

G An analysis of the DNA sequence of each species

H An analysis of photosynthesis for each species

J The collection of seeds from each species

GO ON

33 The Haleakala silversword is a plant found in only one volcanic crater on the Hawaiian island of Maui. Species like the silversword, which are found ONLY on one or a few small islands, are

A unrelated to other species

B at high risk for extinction

C tolerant of a broad range of temperatures

D highly resistant to disease

34 Tall land plants have requirements different from those of aquatic plants. Which of these must the tall land plants have that aquatic plants do not need?

F Photosynthetic abilities

G Organelles for respiration

H A means of reproduction

J Thick cell walls

35 Which of the following statements describes the process of natural selection?

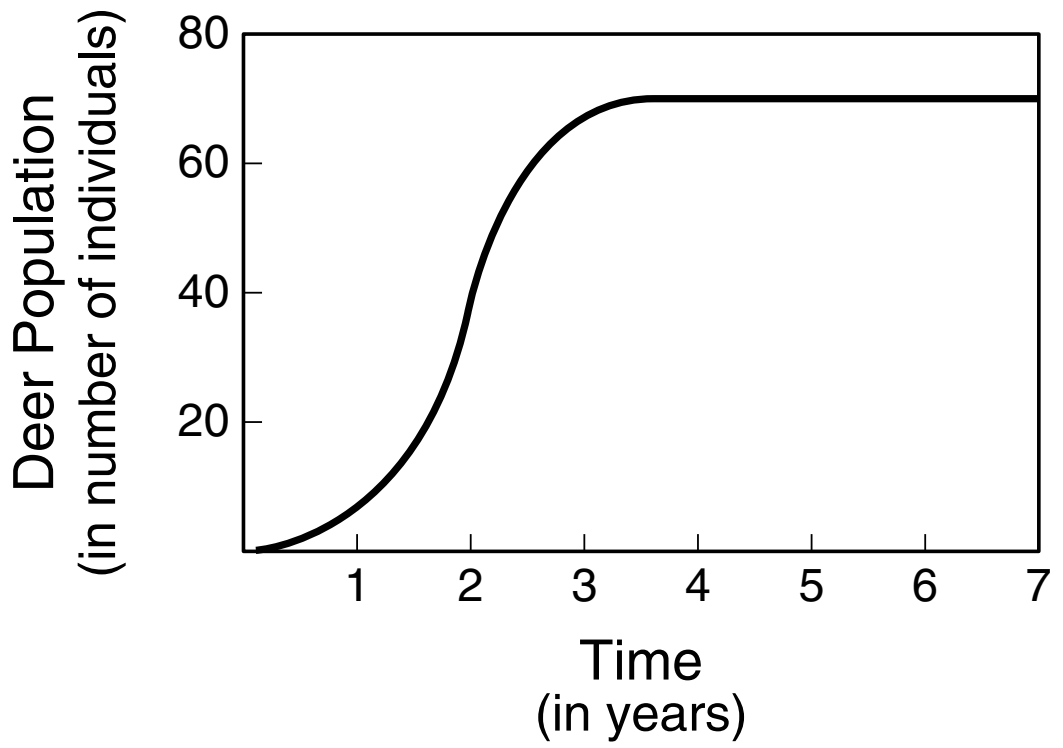
A Farmers select animals with desirable variations for breeding.

B Populations sharing the same gene pool interbreed and create new species.

C Individuals survive that have inherited traits adapted to their environment.

D New species are formed via genetic engineering.

36



In the graph above, what is the population of deer at the carrying capacity of the environment?

F 10

G 30

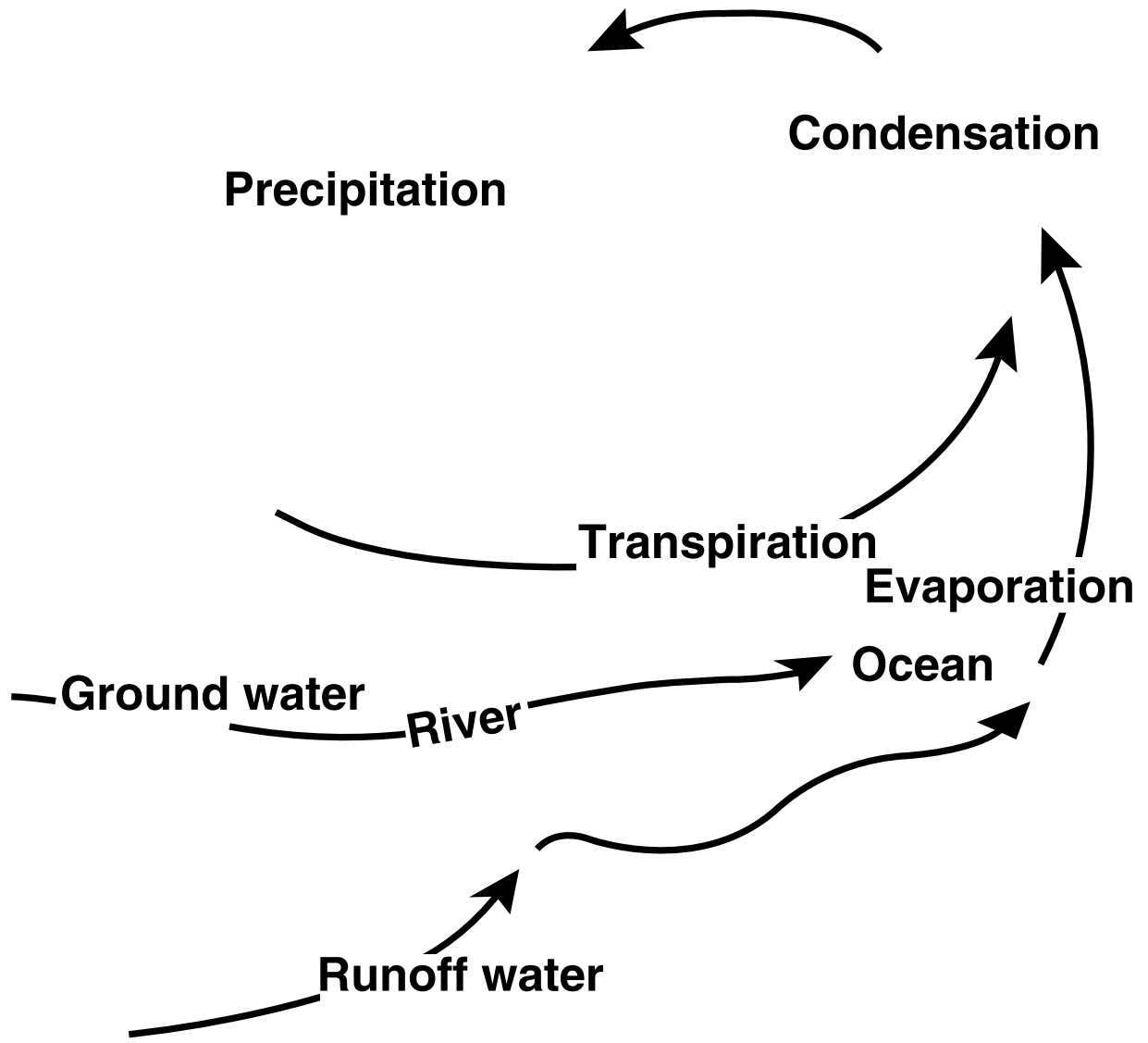
H 50

J 70

GO ON

37

The Water Cycle



According to this simplified water cycle, the process of transpiration is the process that

A causes photosynthesis in plants

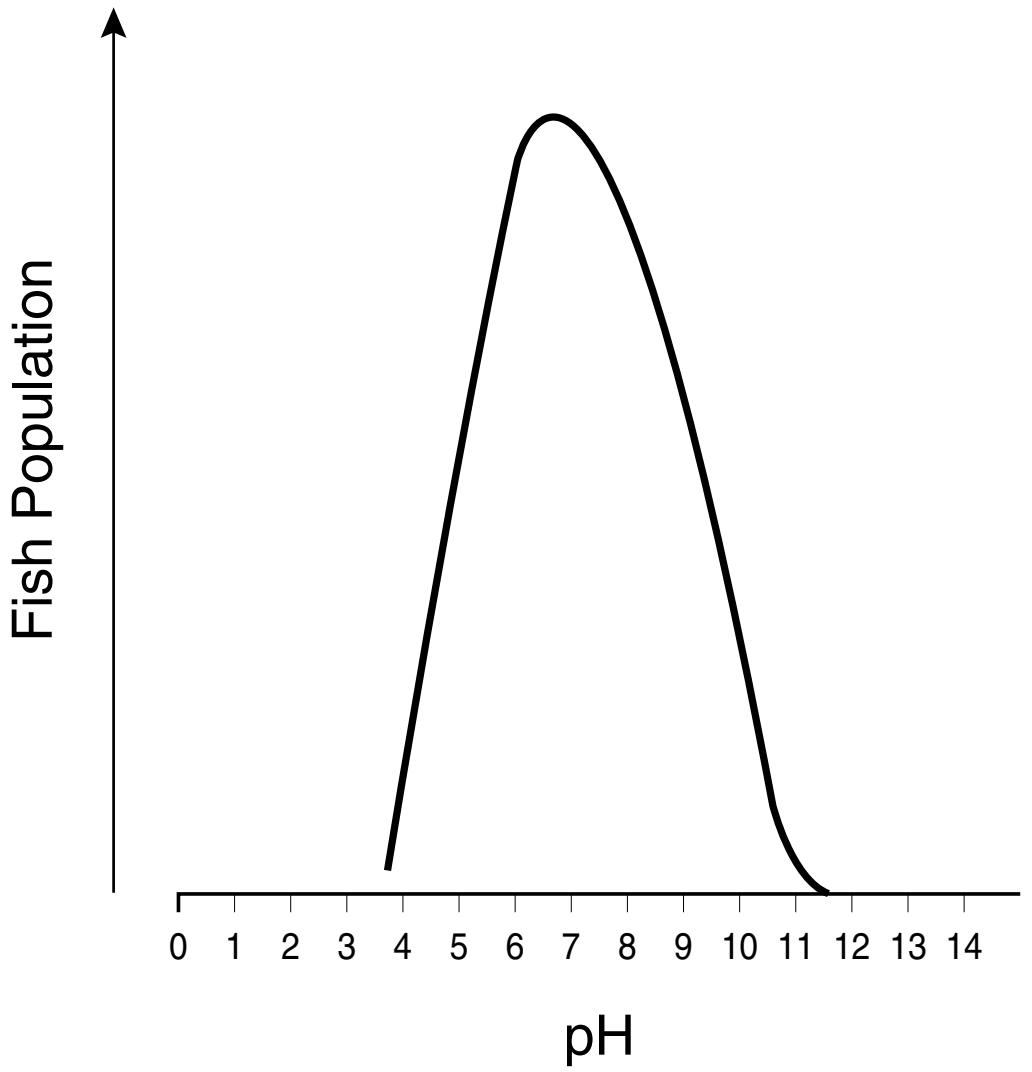
B releases water vapor from plants

C speeds the evaporation of water

D increases the rate of the water cycle

GO ON

38



A lake has a normal pH of 7. Large amounts of acidic waste were dumped into the lake, changing the pH to 4. What will most likely happen?

F The fish will be more resistant to disease.

G The productivity of the pond will increase.

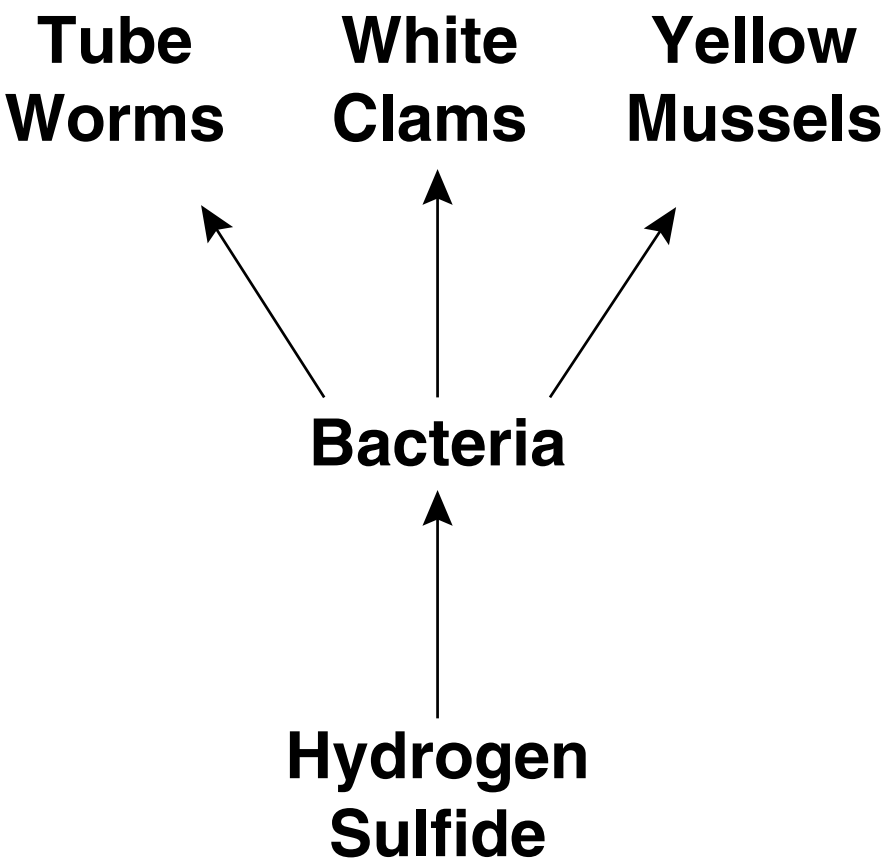
H The spawning rate of the fish will increase.

J The increased acidity will kill most of the fish.

GO ON

39

Deep-Ocean Organisms



Around hot-water vents deep in the ocean live specialized communities. Bacteria turn hydrogen sulfide into sugars by a chemical process. The bacteria then provide food to other life forms, as shown in the diagram. Compared to food chains on land, the bacteria fill the same role as

A hawks

B rabbits

C green plants

D mushrooms

GO ON

40 In which biome do the evaporation rates exceed the precipitation rates?

F Desert

G Tropical jungle

H Grassland

J Hardwood forest

STOP

Answer Key

Test Sequence Number	Correct Answer
1	A
2	F
3	C
4	H
5	A
6	G
7	A
8	J
9	C
10	H
11	D
12	G
13	D
14	G
15	D
16	F
17	D
18	F
19	D
20	J
21	B
22	G
23	D
24	G
25	B
26	G
27	C
28	G
29	A
30	G
31	A
32	G
33	B
34	J
35	C
36	J
37	B
38	J
39	C
40	F